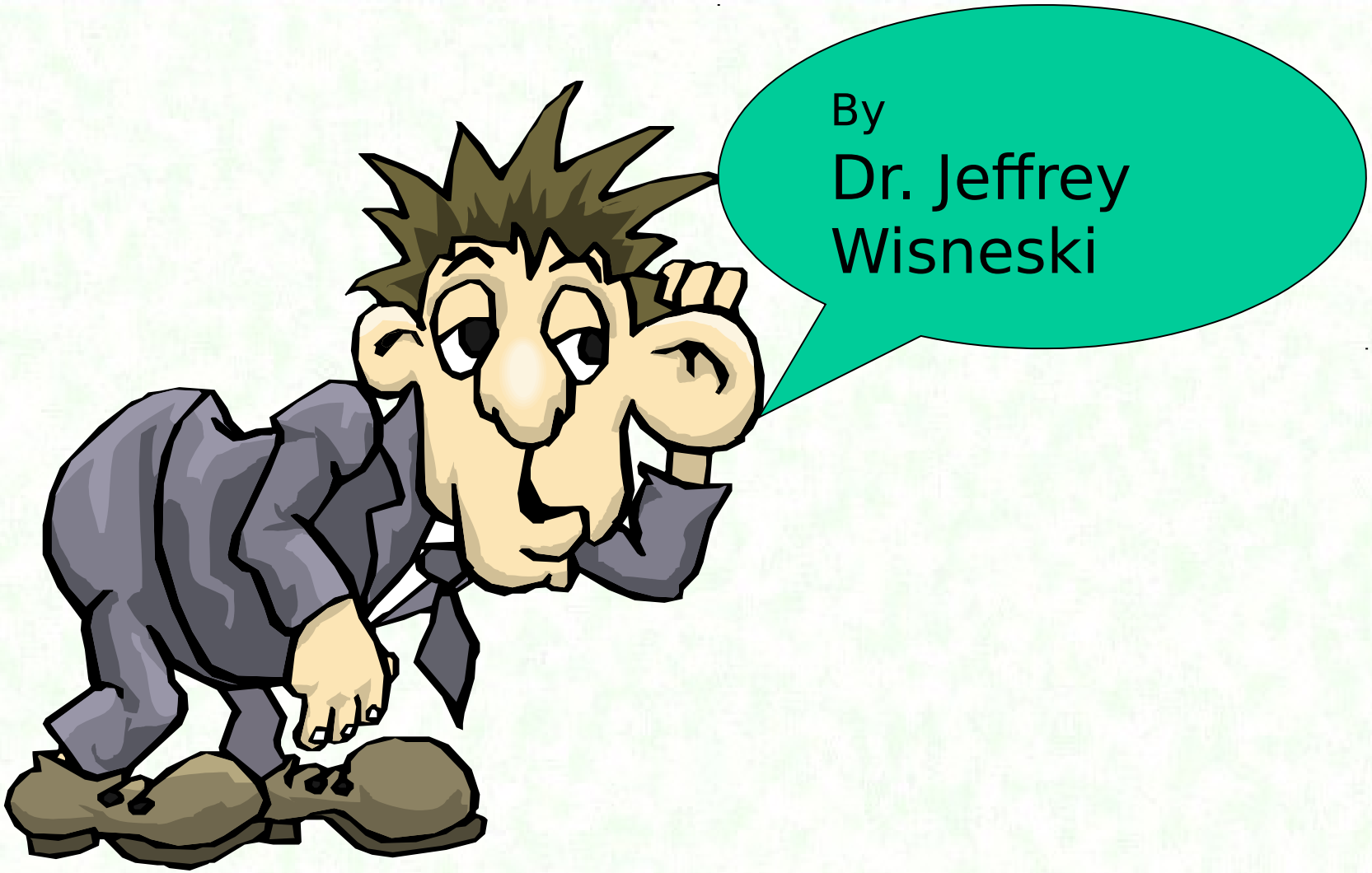
NOISE TRAINING



REASON FOR TRAINING

- OSHA OCCUPATIONAL NOISE EXPOSURE STANDARD 29 CFR 1910.95(a) and (b)
- AFOSH Std 48-19 (Hazardous Noise Program).
- NIOSH NOISE EXPOSURE GUIDELINES
- AFOSH Standard 161-20

- BIO Policies (Baseline, Annual Survey).
- Audiology (Baseline, Annual Evaluation)
- Compensation

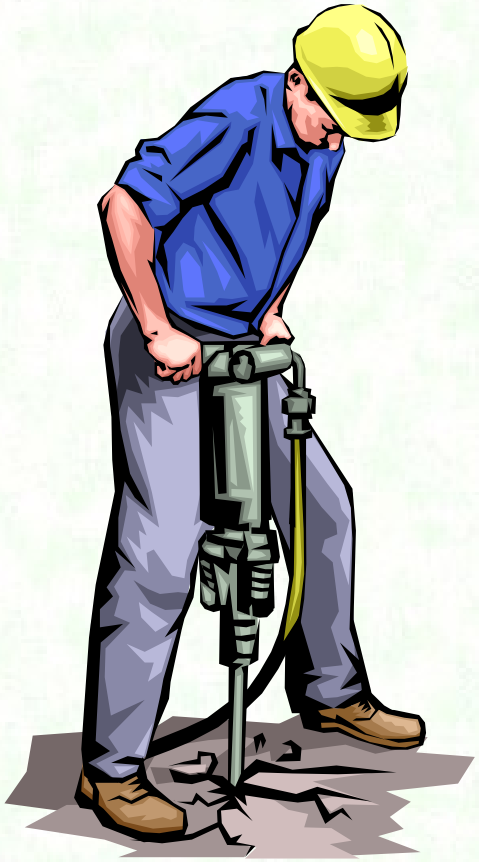
OVERVIEW

What This Presentation Covers

- **Noise exposure at work and the effects of noise on hearing**
- **Noise Levels**
- **Hearing protection – purpose, types and use**
- **Survey/Casefile Documentation**
- **Sound Survey/Instruments (Dosimetry)**

Effects of Noise Exposure

What Exposure to Loud Noise Will Do



- **Exposure to loud noise will inevitably cause hearing loss over time.**
- **Loud noise damages or destroys the hair cells in the inner ear.**
- **Another effect can be “tinnitus” or ringing in the ear.**

Effects of Noise Exposure

When is Noise Too Loud?

- **Noise is measured in units called "decibels" or "dB"**

- **If two people 3 feet apart must shout to be heard, the background noise is too loud (above 85 decibels).**

- **Noise above 140 decibels causes pain and immediate hearing loss.**

Effects of Noise Exposure

When is Noise Considered hazardous?

- **Continuous noise exposure to 85 dB or more**

- **Intermittent, non-impact noise above 115 dB**

- **Impulse or impact noise above 140 decibels causes pain and immediate hearing loss.**

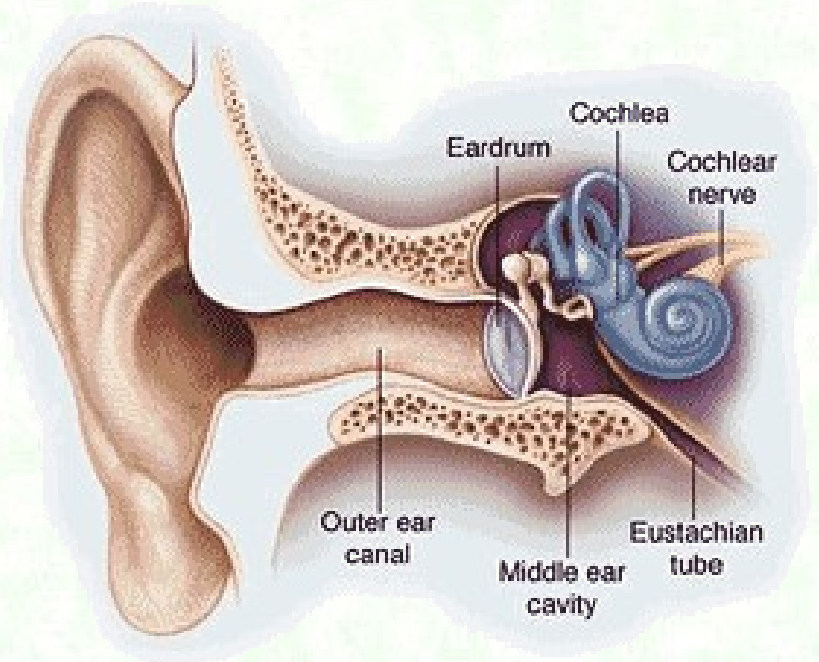
Effects of Noise Exposure: Noise, the Silent Killer

Long Term Exposure to Noise

- Our ears can recover from short exposure to loud noise, but over time damage will occur.

- The longer and louder the noise, the greater chance permanent damage will occur.

- There is really no such thing as “tough ears” or “getting used to it”.



Effects of Noise Exposure

Hearing Loss From Noise Exposure

- **Hearing loss from noise exposure is usually not noticed because it is so gradual.**

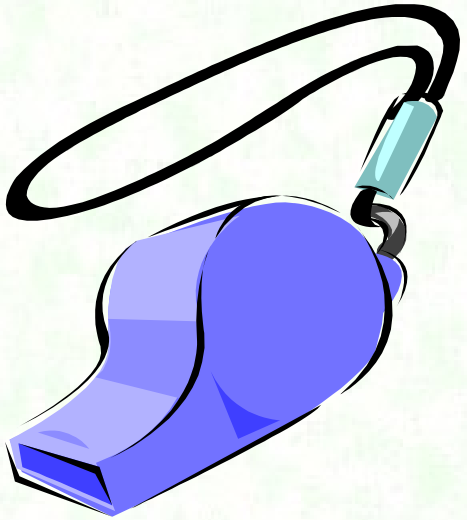
- **Usually a person loses the ability to hear higher pitches first.**

- **Often the first noticeable effect is difficulty in hearing speech.**

Effects of Noise Exposure

Tinnitus From Noise Exposure

- **Exposure to high noise levels can also cause ringing in the ear or “tinnitus”.**



- **Tinnitus sufferers usually complain of constant whistling, squealing, roaring or buzzing in one or both ears.**

- **Severe tinnitus may disrupt sleep, reduce concentration and cause irritability and depression.**

Effects of Noise Exposure

What is Too Much Noise Exposure?

- **Damage from noise exposure depends on the loudness and length of exposure.**

- **Scientific studies have shown that hearing loss can occur when 8-hour average noise exposure exceeds 85 decibels.**

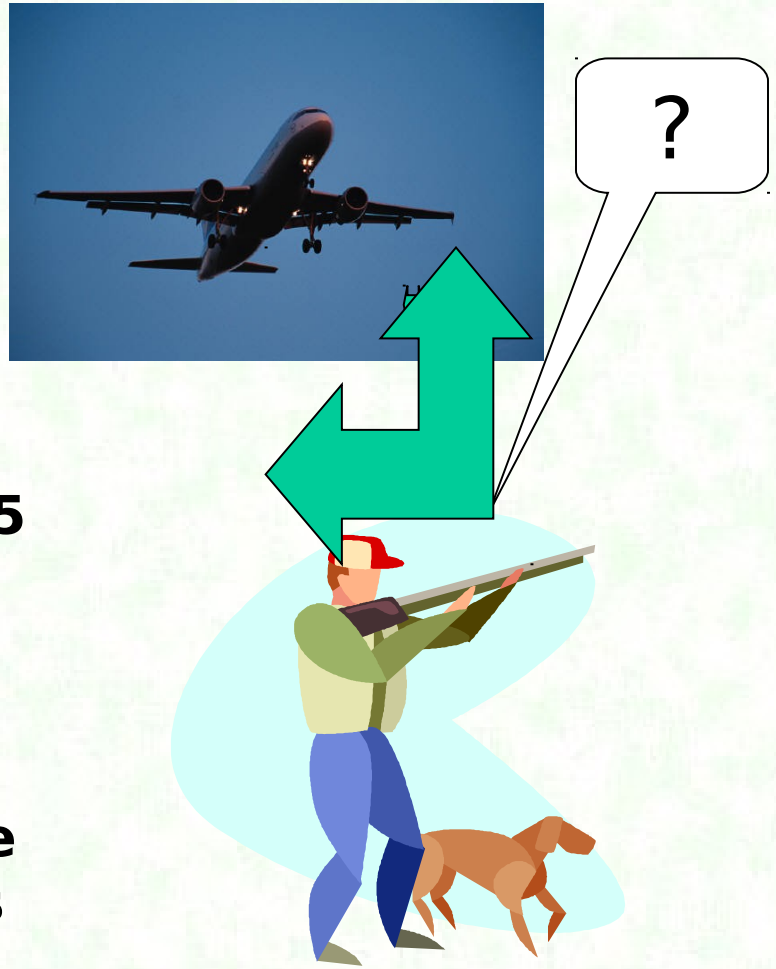
Effects of Noise Exposure

What is Too Much Noise Exposure?

- **The risk of hearing loss increases dramatically as noise levels increase.**

- **Exposure to noise levels above 115 decibels for even 5 minutes is very risky.**

- **Impact or banging noise above 140 decibels will cause immediate damage to nerves in the ear.**



Effects of Noise Exposure

Noise Level: Limiting Values for Unprotected Noise Exposure: OSHA

The table below shows NOISE LEVELS. The duration of unprotected exposure to noise per day shall not exceed the values specified in this table. (AFOSHSTD.48-19Table 3.2)

Noise Level	Allowable Exposure Time
85 (85) decibel	8 hours
90 (88)	4 hours
100 (91)	2 hour
105 (94)	1 hour
110 (97)	30 minutes
115(100)	15 minutes

(115) dB-27 sec (prohibited w/o hearing protection!!)

Noise Levels

Examples of Commonly Used Noisy Equipment

Equipment	Noise Level
Back Hoe	85-95 decibels
Chain Saw	110 decibels
Front-end Loader	90-95 decibels
Gunshot	140 decibels
Jackhammer	112 decibels
Lawn Mower	90 decibels
Tractor	95-105 decibels
Circular Saw	90-100 decibels

Noise Levels

COMMUNICATE

- Discuss noise with workers/supervisor
- Be familiar with noise producing equipment in your shop.
- List noisy equipment, noise sources, and their noise levels.
- Evaluate hearing protection

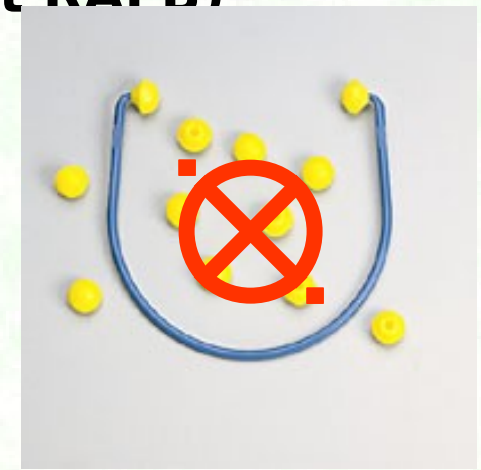
Hearing Protection

Types of Hearing Protection

earmuffs

- **There are three types of hearing protection – ear muffs, earplugs and ear caps.**
- **Ear muffs and earplugs provide about equal protection, ear caps somewhat less (We do not use ear caps at RAFB)**

earplugs



ear caps

Hearing Protection

Types of Hearing Protectors

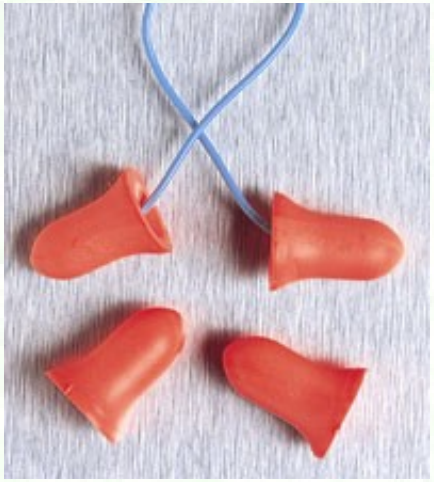
- **All hearing protectors are designed to reduce the intensity (loudness) of noise to the ear.**
- **They work much better than wads of cotton or bits of cloth stuffed in the ear.**
- **All three types have advantages and disadvantages and people vary on which they prefer to use.**

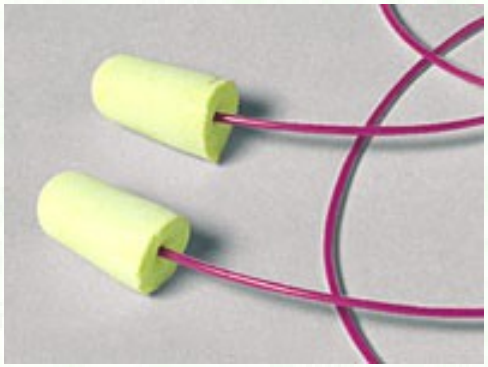
Cotton doesn’t work!!

Hearing Protection

Hearing Protection – Ear Plugs

- **Earplugs are made of foam, rubber or plastic and are either one-size-fits-all or in sizes small, medium and large.**
- **Some are disposable, some are reusable.**
- **They are lightweight, and require no maintenance.**
- **They are inserted into the ear canal.**

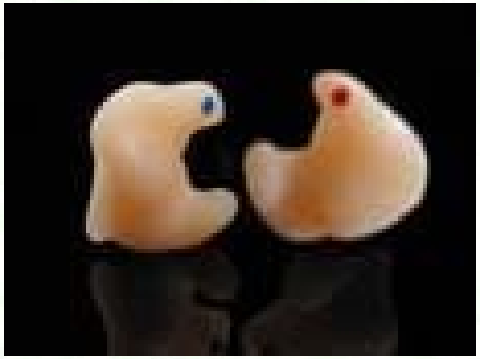




Hearing Protection

Ear Plug Comfort

- **Some people may find ear plugs uncomfortable to wear for long periods at first.**
- **Ear plugs rarely cause infection or prolonged irritation of the ear canal.**
- **Most people can find a comfortable fit by trying several different sizes, types or brands.**
- **Custom-molded earplugs can be obtained for maximum comfort.**

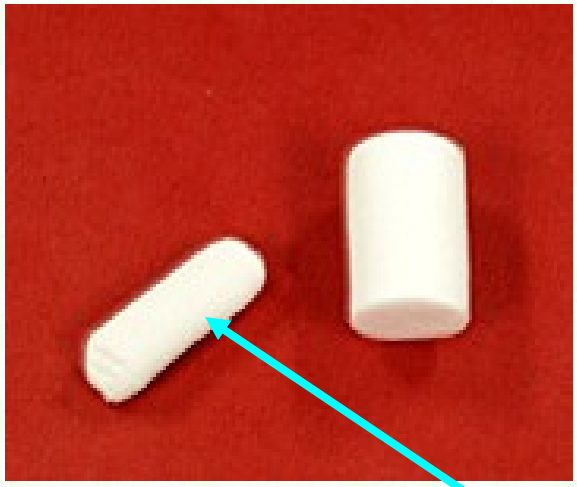


custom molded earplugs

Hearing Protection

Inserting Foam Earplugs

Foam type earplugs are one-size-fits-all and must be inserted properly into the ear.



Roll earplug into small cylinder first, then insert in ear.

Hearing Protection

Inserting Foam Earplugs

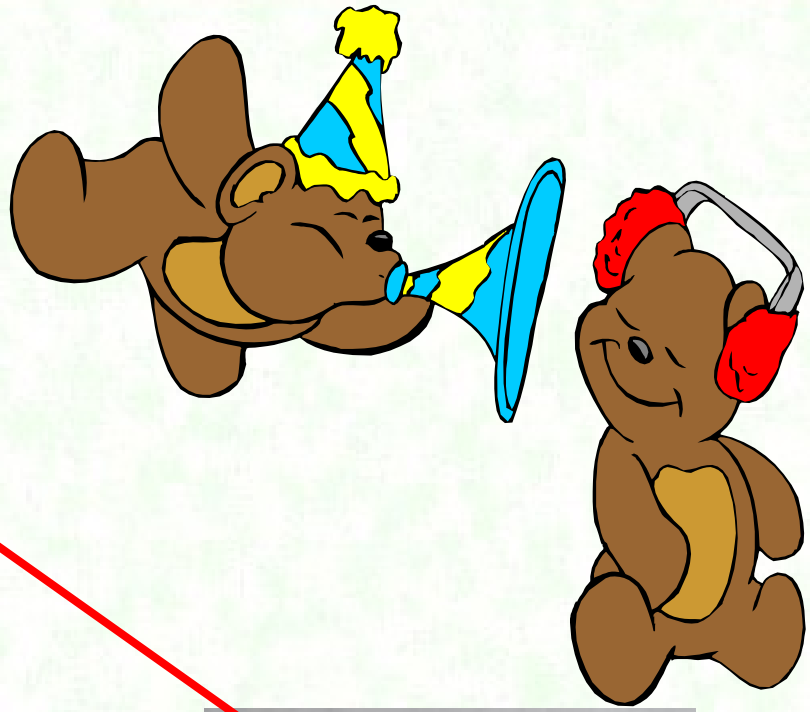
Earplug incorrectly inserted

Earplug correctly inserted

Hearing Protection

Ear Muffs

- **Ear muffs cover the whole ear and are preferred by some (people).**
- **They have replaceable pads and some high-tech styles filter out specific noise pitches.**
- **They last longer than most plugs.**



Hearing Protection

Special Considerations: Attached Earmuffs

- **Some muffs are attached to hardhats or goggles.**

- **Some high-tech muffs can filter out certain frequencies or have radios inside for communication in high noise areas.**

Hearing Protection

Special Considerations: Ear Muff Comfort & Glasses

- **Muffs can be uncomfortable in hot weather.**

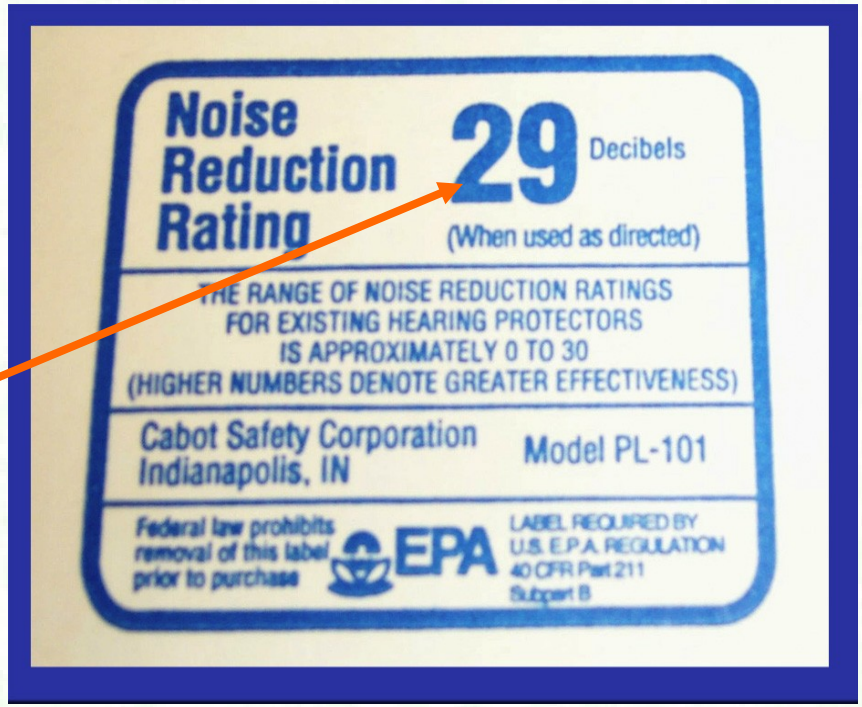
- **Muffs don’t seal well for someone with glasses or heavy sideburns.**

Hearing Protection

Noise Reduction of Hearing Protection

- **The “Noise Reduction Rating” or “NRR” of hearing protection is measured in decibels.**
- **The NRR is found on the earmuff or earplug package. The higher the number, the greater the protection.**
- **EXAMPLE:**

1. **Noise is 92 dBA**
2. **NRR is 29 decibles (dB)**
3. **Noise Level entering ear: 63 dBA**


Noise Reduction Rating
29
Decibels
(When used as directed)
THE RANGE OF NOISE REDUCTION RATINGS FOR EXISTING HEARING PROTECTORS IS APPROXIMATELY 0 TO 30 (HIGHER NUMBERS DENOTE GREATER EFFECTIVENESS)
Cabot Safety Corporation
Indianapolis, IN
Model PL-101
Federal law prohibits removal of this label prior to purchase
EPA
LABEL REQUIRED BY U.S. E.P.A. REGULATION 40 CFR Part 211 Subpart B

Hearing Protection

How can you hear anything with earmuffs on?

- **Using earmuffs or plugs in noisy areas actually makes it easier to hear coworkers or machinery.**
- **They reduce overwhelming loud background noise.**
- **They are similar to dark glasses that reduce the sun's glare making it easier to see.**

Hearing Protection

Proper Use of Hearing Protection

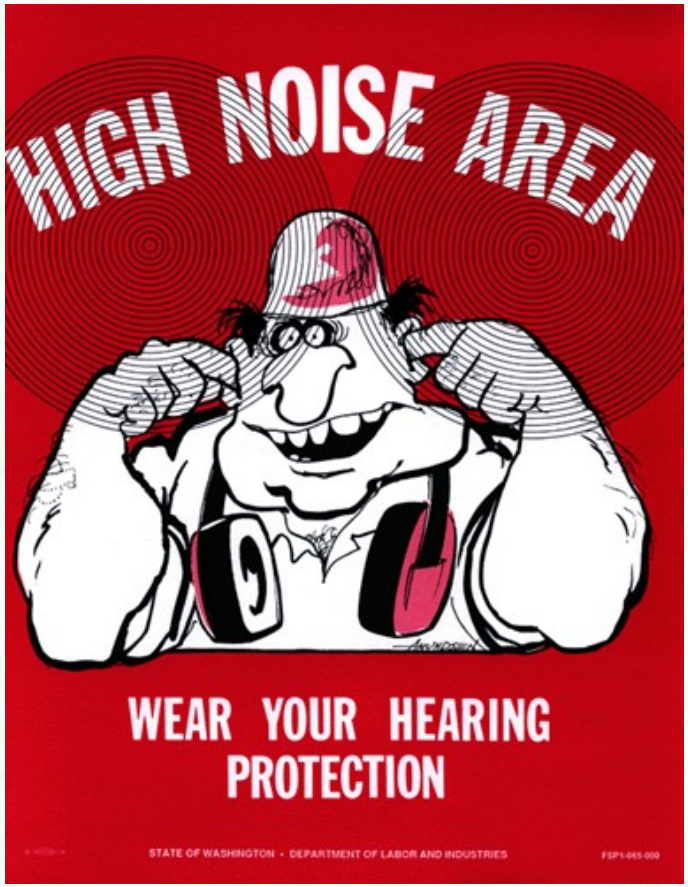
- **Earmuffs and plugs provide good protection only when used properly.**
- **Sometimes people will remove hearing protection for “just a minute” in a noisy area.**
- **In areas of very high noise exposure, this could result in noise overexposure.**

It won’t protect your ears if it is around your neck!!!

Hearing Protection

Proper Use of Hearing Protection

- **It takes just a few minutes of unprotected exposure at noise above 115 decibels to risk hearing damage.**
- **Earplugs not well inserted into the ear canal will not provide complete protection.**
- **Likewise, earmuffs not snug against the head will “leak” noise into the ear.**



Hearing Protection

Hearing Aids Are Not Hearing Protection

- **Hearing aids do not block out enough sound for most workplace noise.**
- **Some hearing aids can actually increase the noise level at the ear.**
- **Just turning off the hearing aids will not prevent further hearing loss from noise exposure.**

Hearing Protection

Portable Radios/CD Players

“Walkmans” do not provide protection from noise.

The earphones are not earmuffs and the music only adds to background other noise.

“Walkmans” can exceed 85 decibels alone.

Audiometric Testing

What is Audiometric Testing?

- **“Audiometric testing” is the same thing as “hearing tests”.**
- **Audiometric testing is required for any employees exposed to excessive noise. Most of us develop a mild hearing loss as we age, especially in the higher pitches.**
- **A severe or significant hearing loss at a younger age may mean you have had excessive noise exposure.**

Audiometric Testing

Purpose of Audiometric Testing

Audiometric testing results can be used to check the following:

If the hearing protection in use is adequate,

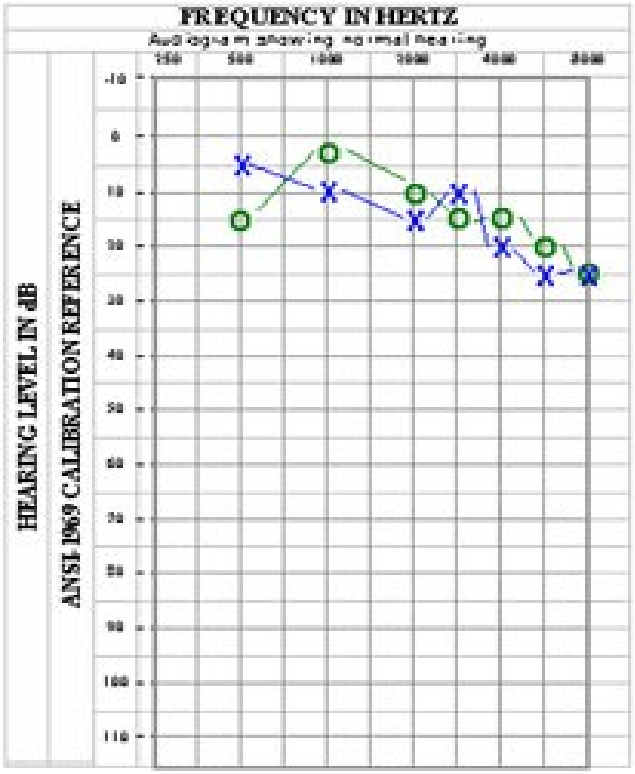
If there is a change in noise exposure,

If there is a medical condition of the ear unrelated to noise exposure.

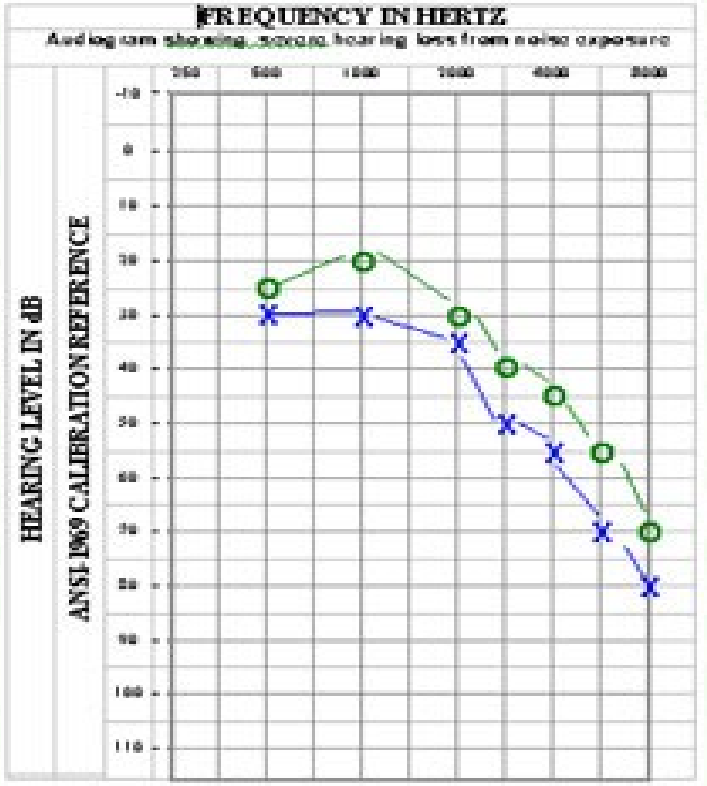
Audiometric testing

What is an Audiogram?

An audiogram is a printed chart of the results of the hearing test. They look similar to the results below.



Normal hearing



Severe hearing loss

NOISE SURVEY/CASEFILE DOCUMENTATION

ACTION ITEMS: (Violation of AFOSH Std 48-19, Hazardous Noise Program)

- Noise Level Exceed 85 decibel A-weighted (dBA)
- Workers were observed not always wearing adequate hearing protection in areas that generate hazardous noise.
- Workers wear ‘wrong’ PPE
- Work Area NOT posted as a Hazardous Noise Area

Quoting Helen Keller:

"…after a lifetime in silence and darkness That to be deaf is a greater affliction than to be blind…
I have imagination, the power of association, the sense of touch, smell, and taste, and never feel blind,

But how can I replace the loss of hearing?

Summary

Noise exposure at work & effects on Hearing
Noise Levels
Hearing protection: purpose, types, use
Reasons: OSHA/NIOSH/AFI's

ANY QUESTIONS?

Bio Env @ 7-7555
Hearing Conservation @ 7-7611

Noise Quiz

Question 1

What happens when people are exposed to excessive noise?

a) They can’t hear someone talking to them.

b) Over a period of time, they will develop hearing loss.

c) Some people may develop permanent ringing in their ears.

d) Some people will be stressed out by constant exposure to loud noise.

Noise Quiz

Question 2

What is the lowest level of noise that can cause hearing loss?

a) When it hurts your ears.

b) 65 decibels

c) 85 decibels

d) An average of 85 decibels over 8 hours.

Noise Quiz

Question 3

What is NRR?

a) The noise level of rifles.

b) The noise rating of any loud machinery.

c) The noise reduction rating of hearing protection.

d) A measure of how well earplugs work.

Noise Quiz

Question 4

Ear plugs work better than ear muffs in blocking out noise.

a) **True.**

b) False.

c) It depends.

Noise Quiz

Question 5

Why is audiometric testing required?

a) **To make sure you haven't gone deaf.**

b) To test for any hearing loss during your employment.

c) To test the noise of machinery.

d) To see how well you remember noise training material.